

## PHYSICIANS' APPREHENSIONS IN MANAGING A FEBRILE CHILD

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## ABSTRACT

**Objectives:** Fever in children under the age of 5 years can be a diagnostic challenge for pediatricians and primary care physicians since it is often complicated to recognize the rationale. In this study, we intend to ascertain their understanding, attitudes and misapprehensions concerning fever in children.

**Methods:** This transversal study was conducted from March to August 2014 by adopting a pre-validated questionnaire. The study population comprised of physicians working in different public and private sector hospitals and clinics of Karachi. Descriptive statistics was employed to acquire the response of respondents to questionnaire items. Kruskal-Wallis H test was executed to evaluate the association of gender, position, experience and institution of physicians with their responses.

**Results:** The response rate for filling the questionnaire was 71%. More than 97% considered fever risky for a child, 92.25% considered that neurological disorders, seizures and fatality are problems associated with fever. More than 95% opined that when the fever increases then the possibility of febrile convulsions increases. High fever was considered as a sign of severe bacterial infection by majority (90.14%) of participants. Many (79%) opined that the body temperature of above 38°C must absolutely be treated in spite of the causal pathology. Majority of the physicians recommended physical methods such as baths (90.14%), cold application, (82.39%) and rubbing the body with alcohol (28.87%) to be utilized in reducing fever.

**Conclusion:** The study revealed that there were misapprehensions about fever and its associated problems. This demands the execution of educational intervention employing international guiding principles concerning the appropriate management of the febrile child.

**Keywords:** Fever, Physicians, Febrile child, Pakistan.

## INTRODUCTION

Pakistan has been able to condense mortality rate for children by 15% since, 1990, but still it is among five countries with highest child mortality rate (85.9%) in 2012 [1]. Statistical facts have revealed that about 550,000 children under 5 years depart their lives in Pakistan from avertable reasons with some evidence that this is associated with scarceness in health care system [2]. Among such reasons, fever is the most prevailing infirmation in children and a leading cause owing to which parents bring their children to therapeutic consideration [3]. Pediatricians have to face diagnostically confront since it is often complicated to recognize the rationale of fever in children under the age of 5 years. Pediatricians' approach toward fever play a decisive role in motivating the parental fever-phobia [4]. Most febrile experiences are not perilous and in actual fact, may be a favorable response to infection. Fever is body's own disease-fighting arsenal: Increase in body temperature is able to kill off numerous disease-producing organisms. Mostly it is due to a self-limiting viral infection, but in subsidiary cases, it may also be due to severe bacterial infections [5]. Immunologic systems are improved in fever, and the capability of viruses and bacteria to make a replica is reduced [6-8].

Fever management includes recognizing the basis for the fever and symptoms obligating medicinal intervention. The symptoms can be condensed by in cooperation of non-pharmacological and pharmacological means. Employing physical methods is suggested in cases of hyperthermia, in which body temperature increases independently due to heat stroke and sunstroke. It does not hinder with the vital mechanisms of body temperature control [9]. Physical methods encompass the exposure to cold air, use of ice bags, bathing, sponge baths and rubbing the body with alcohol. On the other hand, it is universal medical practice to lessen the child's uneasiness by

treating the signs and symptoms of fever, mainly with antipyretic drugs [10]. The antipyretic drugs that are normally used in children are paracetamol and ibuprofen. However, reciprocal or intermittent use of ibuprofen and paracetamol is not suggested [11]. Avertable antipyretic administration and irregular antipyretics boost the possibility of overindulging with potentially severe consequences. Evidence-based strategies for the utilization of antipyretics in mild to temperate fever are compulsory.

Health experts' encouragement of redundant fever attenuation strengthens negative beliefs and can protract illnesses. Majority of the pediatricians assumed that the fever is dangerous and the main reason of brain damage and febrile convulsions [12]. They must revise their understanding and influence parents in a scientific approach based on the most recent evidence. Contemporary folklores and misapprehensions must be tackled to enable physicians to counter with evidence-based information when confronted. Ambiguous information regarding managing fever from health professionals is excruciating. Few studies have broadly addressed the issue of managing fever as a clinical problem. With this background, we designed this study to ascertain knowledge, attitudes and misapprehensions of physicians concerning fever in children.

## METHODS

**Study design and study period**

This transversal study was conducted from March to August 2014 by adopting a pre-validated questionnaire.

**Study population**

The study population comprised of physicians working in different public and private sector hospitals and clinics of Karachi.

### Study tool

A pre-validated questionnaire used in other study was adapted and modified [5]. In addition to the demographic information of the physicians, the questionnaire consisted of 22 items exploring their understanding, attitudes and apprehensions concerning fever in children.

### Ethical approval

Prior permission was taken from the various heads of department in the hospitals and clinics. The questionnaires were distributed to the physicians after explaining the purpose of the study through email or direct correspondence. Their verbal consent was taken, and the questionnaires were left with them for a period of 1 week. After a given period the filled questionnaires were collected back.

### Data analysis

The retrieved questionnaires were entered into Statistical Package for Social Sciences (SPSS 20.0, Chicago, IL, USA) for analysis. The demographic data of the participants was estimated in frequencies and percentages. Descriptive statistics were employed to acquire the response of respondents to questionnaire items. Kruskal-Wallis H test was executed to evaluate the association of gender, position, experience and institution of physicians with their response.

### RESULTS

In the present, study one hundred and forty-two physicians from different private and public sector clinics and hospitals of Karachi provided consent to show their responses for research purposes. The response rate for filling the questionnaire was 71%. The demographic data of the participants is shown in Table 1. Majority of the respondents were female (68.3%) while 31.69% were male. Most of the respondents (71.83%) participated were employed in public sector hospitals. 50% of the participants were rendering their services as Medical officer whereas 25.35%, and 20.41% were Resident Medical Officers and consultants respectively. Majority of physicians (46.47%) were having an experience of 5-10 years.

Responses of the physicians regarding their knowledge are illustrated in Table 2. The study revealed that 63.38% of the participants did not receive any training regarding fever after their postgraduate studies. More than half (66.19%) of the respondents did not study any article associate with fever in the last 6 months. More than 97% considered fever risky for a child, 92.25% considered that neurological disorders,

seizures and fatality are problems associated with fever. More than 95% opined that the risk of febrile convulsions increases when the fever increases. Many (78.87%) opined that the body temperature of above 38°C must be treated despite of the causal pathology. Majority of the physicians recommended physical methods like baths (90.14%), cold application (82.39%) and rubbing the body with alcohol (28.87%) as an aid to decrease fever. High fever was considered as a sign of severe bacterial infection (90.14%). Only 38.73% considered teething is a major reason for fever in children under the age of 5 years. More than 77% suggested the use of paracetamol or ibuprofen as a preventive measure to protect a child from fever and other local effects related with babyhood vaccination. 72.53% believed that ibuprofen and paracetamol can be used alternatively. Near about 60% preferred oral route over rectal for paracetamol administration in children. Around 62% did not use acetylsalicylic acid in a feverish child.

Kruskal-Wallis H test, a non-parametric test was executed to evaluate the association of gender, position, experience and institution of physicians with their response (Table 3).

### DISCUSSION

Fever accounts for 19-30% of visits in primary care pediatric practice [13]. Most experts believed that the fever is useful physiological reaction to an infectious process as it is most commonly associated with self-limited viral illness. Sometimes it may be the presenting feature of occult bacteremia and if remain untreated; can lead to meningitis or other serious scream [14]. Even though, the management of febrile children between 3 and 36 months without an evident source remains contentious. Toddlers and infants are predominantly prone to fever for the reason of their body size, low amount of subcutaneous fat and high ratio of body surface area to weight. There is a greater discrepancy between the incidence of fever in clinical practice and the proper training dedicated to its pathophysiology and management [15]. Our study revealed that the majority of the general practitioners (97%) considered fever risky for a child, 92.25% considered that neurological disorders, seizures and fatality are problems associated with fever. More than half (66.19%) did not read any article associated with fever in the last 6 months. There is little data published regarding fever in major pediatric texts [16]. Many (63.38%) of the participants did not receive any training regarding fever after their postgraduate studies. Lack of published data and training sessions are the contributing factors owing to which a febrile child cannot be treated effectively.

Research has shown that fever phobia is widespread among parents and health care workers. Misunderstanding about problems of fever particularly febrile convulsions usually drive health care personnel to treat fever over and this emphasizes the phobia amongst parents [17,18]. This was in compliance with our study that most of the physicians (95%) opined there is a positive association between the height of a fever and the occurrence of feverish convulsions. Previous research have shown that there have been no facts to recommend that brain damage, intellectual disability, death or epilepsy are well-recognized consequences of usual febrile convulsions. Fever higher than 41.7°C may be the cause of neurological complications, but mostly these problems are associated with human mistakes and related heat stroke can occur with children having over clothing, left in a crib next to a radiator or left exposed directly to sunshine in hot environment [17]. Youssef reported that more than 50% of the general practitioners believed febrile convulsions are a considerable risk to the child [17]. Many (79%) opined that the body temperature of above 38°C must certainly be treated despite the basic pathology. Majority of the physicians recommended physical methods like baths (90.14%), cold application (82.39%) and rubbed the body with alcohol (28.87%) to lessen fever. High fever was considered as a sign of severe bacterial infection (90.14%). Only 38.73% considered teething is a most important cause for fever in children under the age of 5 years. In another research, it has been demonstrated that the difference in temperature remained within the standard range during the teething phase [19].

**Table 1: Characteristics of study population**

Gender	
Male	45 (31.69)
Female	97 (68.30)
Age (years)	
25-30	37 (26.05)
31-35	64 (45.07)
36-40	20 (14.08)
41-50	15 (10.56)
51 and above	6 (4.22)
Organization	
Private	40 (28.16)
Government	102 (71.83)
Position	
Consultants	29 (20.41)
Chief medical officer	3 (2.11)
Medical officers	71 (50)
Head of department	3 (2.11)
Resident medical officer	36 (25.35)
Experience (years)	
>5	50 (35.21)
5-10	66 (46.47)
10-15	14 (9.85)
15-20	7 (4.92)
20 and above	5 (3.52)

**Table 2: Distribution of physicians' agreement to some statements regarding fever management and complications in febrile children under the age of 5**

Statement	Yes	No	Don't know
Did you receive any training regarding fever after their postgraduate studies	52 (36.61)	90 (63.38)	0
Did you read any article associated with fever in the last 6 months	44 (30.98)	94 (66.19)	4 (2.81)
Fever is dangerous for a child	138 (97.18)	4 (2.81)	0
Fever lower than 38°C should absolutely be treated even when there are no other signs and symptoms	83 (58.45)	55 (38.73)	4 (2.81)
A body temperature of above 38°C must absolutely be treated whatever the underlying pathology	112 (78.87)	30 (21.12)	0
Prevention of febrile convulsion is the main reason for antipyretic usage	85 (59.85)	52 (36.61)	5 (3.52)
Brain damage, seizures and death are complications of fever	131 (92.25)	6 (4.22)	5 (3.52)
Medical treatment must absolutely be used in reducing fever	115 (80.98)	26 (18.30)	1 (0.70)
Physical methods like baths should be recommended to reduce fever	128 (90.14)	10 (7.04)	4 (2.81)
Cold application should be recommended to reduce fever	117 (82.39)	21 (14.78)	4 (2.81)
Rubbing the body with alcohol must be recommended to reduce fever	41 (28.87)	67 (47.18)	34 (23.94)
Sleeping febrile children must not be disturbed	53 (37.32)	69 (48.59)	20 (14.08)
Fever is a risk factor for brain damage	125 (88.02)	13 (9.15)	4 (2.81)
Risk of febrile convulsion increases when the fever increases	135 (95.07)	4 (2.81)	3 (2.11)
Brain damage may occur after febrile convulsion	120 (84.50)	20 (14.08)	2 (1.40)
Teething is a reason for fever	55 (38.73)	73 (51.40)	14 (9.85)
Paracetamol or ibuprofen usage should be recommended to prevent fever and local reactions associated with childhood vaccination	110 (77.46)	22 (15.49)	10 (7.04)
High fever may be used as an indicator of severe bacterial infection	128 (90.14)	9 (6.33)	5 (3.52)
Paracetamol and ibuprofen are the only antipyretic drugs recommended for use in children	67 (47.18)	71 (50)	4 (2.81)
Ibuprofen and paracetamol can be used alternatively	103 (72.53)	30 (21.12)	9 (6.33)
Acetylsalicylic acid should not be used in a febrile child	87 (61.26)	28 (19.71)	27 (19.01)
Oral administration of paracetamol is preferable to rectal administration in children	84 (59.15)	48 (33.80)	10 (7.04)

**Table 3: Influence of gender, experience, position and organization on responses**

Statement	Gender		Experience		Position		Organization	
	$\chi^2$	Significant	$\chi^2$	Significant	$\chi^2$	Significant	$\chi^2$	Significant
Did you receive any training regarding fever after their postgraduate studies	1.726	0.189	19.778	0.000*	7.228	0.204	4.750	0.029*
Did you read any article associated with fever in the last 6 months	0.000	0.987	18.852	0.000*	20.523	0.000*	0.051	0.822
Fever is dangerous for a child	8.810	0.002*	19.541	0.000*	5.492	0.359	0.020	0.887
Fever lower than 38°C should absolutely be treated even when there are no other signs and symptoms	0.113	0.737	16.871	0.002*	13.308	0.020*	10.447	0.001*
A body temperature of above 38°C must absolutely be treated whatever the underlying pathology	0.047	0.828	5.582	0.233	10.088	0.073	0.498	0.480
Prevention of febrile convulsion is the main reason for antipyretic usage	3.412	0.065	8.877	0.064	8.471	0.132	7.654	0.005*
Brain damage, seizures and death are complications of fever	2.868	0.090	2.757	0.599	8.893	0.113	1.437	0.231
Medical treatment must absolutely be used in reducing fever	0.079	0.779	4.959	0.292	8.151	0.148	8.881	0.00*
Physical methods like baths should be recommended to reduce fever	0.636	0.425	7.158	0.128	3.170	0.674	0.001	0.979
Cold application should be recommended to reduce fever	0.813	0.367	8.289	0.082	12.282	0.031*	16.092	0.000*
Rubbing the body with alcohol must be recommended to reduce fever	0.155	0.694	11.673	0.019*	7.603	0.179	11.226	0.000*
Sleeping febrile children must not be disturbed	0.376	0.540	2.647	0.619	11.210	0.047*	0.591	0.442
Fever is a risk factor for brain damage	1.691	0.193	13.858	0.007*	21.871	0.000*	0.642	0.423
Risk of febrile convulsion increases when the fever increases	3.390	0.066	2.238	0.692	13.045	0.022*	2.865	0.091
Brain damage may occur after febrile convulsion	1.041	0.308	4.593	0.332	11.439	0.043*	0.326	0.568
Teething is a reason for fever	2.908	0.088	2.235	0.693	2.281	0.809	1.855	0.173
Paracetamol or ibuprofen usage should be recommended to prevent fever and local reactions associated with childhood vaccination	0.047	0.829	15.958	0.003*	6.654	0.248	0.825	0.364
High fever may be used as an indicator of severe bacterial infection	0.169	0.681	8.042	0.090*	13.956	0.015*	0.000	0.993
Paracetamol and ibuprofen are the only antipyretic drugs recommended for use in children	0.223	0.637	5.076	0.280	7.109	0.213	0.182	0.670
Ibuprofen and paracetamol can be used alternatively	0.052	0.820	13.355	0.009*	9.461	0.092	3.112	0.078
Acetylsalicylic acid should not be used in a febrile child	1.787	0.181	3.129	0.537	22.283	0.000*	1.201	0.273
Oral administration of paracetamol is preferable over rectal administration in children	0.265	0.607	12.044	0.017*	4.74	0.449	0.241	0.623

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Antipyretic use consequently plays a most important part in pediatric practice; physicians usually have a preference to advise antipyretic

agents adding together non-pharmacologic, physical fever-reducing modalities [20]. Facts concerning the benefits of mild to moderate fever



and acclamations for antipyretics based on the child's welfare have been reported in the text for more than two decades [3,21-23].

According to National Institute for Health and Clinical Excellence (NICE) guiding principles, antipyretics should not be used consistently in managing fever in children, though they may be used in children who illustrate signs of uneasiness, including lingering weeping, tetchiness, insomnia, anorexia and reduced movement [24,25]. In contrast, World Health Organization (WHO) guiding principles suggest using paracetamol whenever body temperature is  $>39^{\circ}\text{C}$  [26]. According to current WHO document, the habitual usage of antipyretics in children is discouraged, as the function of antipyretic drugs with chronic malnutrition, malaria or sepsis has not been established in children until now [27]. In the present study, around 80% of participants agreed that the medical treatment must absolutely be used in the management of fever. It is suggested to treat a feverish child with antipyretic medicines only if the temperature is over  $39.0^{\circ}\text{C}$  and if the child is not comfy [28]. More than 77% suggested the use of paracetamol or ibuprofen as a preventive measure to protect a child from fever and other local effects related with babyhood vaccination. Managing fever with antipyretics has increased from 67% in 1980 [28] to 95% in 2002 [6]. A study conducted in Israel showed that 8.7% physicians considered antipyretic usage for the prevention of febrile seizures [29]. Demir reported 75% general practitioner used antipyretic drugs to avoid febrile seizure [5] which was similar to the trend observed in our study. According to NICE course of action, antipyretic agents did play any role in putting off febrile convulsions [24]. Paracetamol and ibuprofen at the recommended dosage are usually effectual and well-tolerated antipyretics but in certain conditions like chickenpox, dehydration and paracetamol-or NSAID-induced asthma the use of paracetamol and ibuprofen is not suggested [30,31]. Reciprocal or intermittent use of ibuprofen and paracetamol is not suggested [9]. In the current study, 72.53% believed that Ibuprofen and paracetamol can be used alternatively. It is also believed that oral and rectal preparations of paracetamol have identical antipyretic effects and can be administered interchangeably. Oral administration of paracetamol is preferable for the reason that the absorption is more constant, and it is possible to attain a more accurate dosage based on body weight. Rectal route should be considered only in the incidence of vomiting or further circumstances that avert oral administration [32-34]. The findings of our study revealed that near about 60% preferred oral route over rectal for paracetamol administration. Around 62% did not use acetylsalicylic acid in a feverish child. Evidences also suggest that acetylsalicylic acid should not be used in children aged  $<15$  years since there arise a risk of Reye's syndrome [35]. Steroids should be strongly discouraged for fever in children for the reason of their reduced benefit-risk ratio [36]. Ibuprofen has the lowest risk of severe upper GI tract adverse effects amongst other NSAIDs [11]. The conclusion of this study is comparable to the previous findings and demonstrated differing opinions of physicians in their perceptive of fever and its management in children [12,37,38].

## CONCLUSION

The study revealed that the feverish illness is variably managed owing to the misapprehensions about management and complications of a fever. Contradictory results about fever in the text also substantiate this misapprehension. There is an evident need to for the management of fever by the execution of educational intervention employing international guiding principles concerning the appropriate management of the febrile child.

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